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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,609	03/29/2004	Luke P. Lee	313S-300610US	5428
22798 7590 02/08/2007 QUINE INTELLECTUAL PROPERTY LAW GROUP, P.C. P O BOX 458 ALAMEDA, CA 94501			EXAMINER MORAN, MARJORIE A	
			ART UNIT	PAPER NUMBER
			1631	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.		Applicant(s)	
	10/814,609		LEE, LUKE P.	
	Examiner		Art Unit	
	Marjorie A. Moran		1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 2-5, 10-12, 15-17 and 29-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 6-9, 13, 14 and 18-28 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/22/04</u> . | 6) <input type="checkbox"/> Other: _____ |

Election/Restrictions

Applicant's election of single-strand oligonucleotides in the reply filed on 11/14/06 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 2-5, 10-12, 15-17, and 29-32 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention or species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11/14/06.

An action on the merits of claims 1, 6-9, 13, 14, and 18-28, as they read on probe/receptor molecules which are single-stranded oligonucleotides, follows.

Information Disclosure Statement

The IDS filed 11/22/04 has been considered in full. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited on the IDS filed 11/22/04 or have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figures 12-14 do not use different symbols to differentiate the data shown therein. It appears that these Figures may be colored drawings, but the specification does not refer to colors, and none of the requirements for filing colored drawings have been complied with; e.g. petition and statement in the specification. See below. Figure 17A has different shadings wherein some parts of the Figure are no longer visible. The legends at the bottom of each of Figures 17A and B are illegible. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Color photographs and color drawings are not accepted unless a petition filed under 37 CFR 1.84(a)(2) is granted. Any such petition must be accompanied by the appropriate fee set forth in 37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and, unless already present, an amendment to include the following language as the first paragraph of the brief description of the drawings section of the specification:

The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

Color photographs will be accepted if the conditions for accepting color drawings and black and white photographs have been satisfied. See 37 CFR 1.84(b)(2).

Specification

The abstract of the disclosure is objected to because the first "sentence" is not a grammatically correct, complete sentence. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 1 is objected to because of the following informalities: the term "dynamical" in the last line should be --dynamically--. Also in the last line, the term --the-- should be inserted before "presence". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 6-9, 13, 14, and 27-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is directed to a biodetector (device) but recites a step of "detecting presence of...substances of interest." It is unclear what limitation of the claimed DEVICE is intended by recitation of a method step, therefore claim 1 is indefinite.

Claim 8 recites a method step of forming nanogaps by "removing an oxide." It is unclear what limitation of the DEVICE is intended by reciting a method step, therefore claim 8 is indefinite.

Claim 27 is directed to a nanogap hybrid device, as set forth in the preamble,, then recites means for exposing substances of interest to a "nanogap hybrid device" in lines 5-6. It is unclear (a) whether the means for exposing is actually intended to be part of the nanogap hybrid device, or is separate from the device because (b) it is unclear whether the nanogap hybrid device to which a substance is exposed is the claimed device or is another device which is then exposed TO the claimed device. As it is unclear what is intended to be exposed to what, it is also unclear (c) whether the molecules "able to attach to ...substances of interest" are the same or different as the receptor molecules arranged in the gaps which are recited in line 4. AS it is unclear just what "means for exposing" are intended, claim 27 is indefinite. For purposes of applying the prior art, the claim is interpreted to be directed to a device comprising means for exposing one or more substances of interests to the device.

Claim 28 limits a device to one made by a particular method. It is unclear what structural or functional limitation is intended by reciting a method of "creating" the device, therefore claim 28 is indefinite.

Claim 28 recites several method steps; i.e. application of a voltage, determination of capacitance, detecting, and measuring. It is unclear what limitations of the claimed device are intended by recitation of method steps, therefore the claim is indefinite. For purposes of applying the prior art, the claim is interpreted to recite only that the device

of claim 26 comprises polysilicon chips riddled with nanogap junctions and that the receptor molecules in the gaps are limited to comprise at least one strand of "reference" single-strand DNA.

Claim 28 recites "reference" single strand DNA. It is unclear what the DNA is intended to be a "reference" for, therefore claim 28 is indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 6-9, 13, 14, and 18-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over BERGGREN et al. (IDS ref: Electroanalysis (2001) vol. 13/3, pp. 173-180) in view of BERGGREN et al. (IDS ref: Electroanalysis (1999) vol. 11/3, pp. 156-160) and FONASH et al. (US 2003/0040173, filed 8/14/01).

BERGGREN (2001) teaches a capacitor-based biodetector comprising a plurality of nanogaps with probe/receptor molecules in the gaps (p. 174, fig. 1), means for exposing the biodetector to a sample suspected of containing an analyte of interest (p. 172, Section 2.2 and Figure 1A), and means for measuring dielectric properties across the nanogaps (p. 175, Section 2.2.1 and Figure 3), as recited in claims 1, 18, 26, and 27. BERGGREN (2001) teaches a device comprising a layer of silicon and a layer of silicon oxide (Figure 4), as recited in claims 6 and 9. BERGGREN teaches a frequency

of 1.5 KHz (p. 177, Section 2.2.2), as recited in claim 24. BERGGREN (2001) does not teach single-stranded oligonucleotides in her gaps.

BERGGREN (1999) teaches biodetectors comprising short single-stranded oligonucleotide probes (p. 156), wherein probes comprise 16-40 bases (p. 158, Section 3.2), as recited in claims 22, 23, and 28.. Neither BERGGREN (2001) or (199) teaches particular sizes of gaps.

FONACH teaches a molecular scale device comprising gaps of less than 1 micron wherein at least one molecule is positioned in the gap (para 17), and specifically teaches that the gaps may be as small as 20 nm (para 13), as recited in claims 13, 14, and 21. FONACH teaches that his device comprises several layers, wherein one layer may be silicon oxide which is etched or removed (para 35) to produce walls and caps, as recited in claims 7 and 8. FONACH teaches a variety of geometries for his gaps/channels (Fig.), as recited in claims 19 and 20. FONACH teaches nanoplumbing "features" (para 57), as recited in claim 25.

It would have been obvious to one of ordinary skill in the art at the time of invention to have used the single-stranded oligonucleotides of BERGGREN (1999) as the probes/receptors in the biodetector of BERGGREN (2001) where the motivation would have been to detect specific DNA molecules at very low concentrations, as taught by BERGGREN (1999, p. 159, Section 4). One skilled in the art would reasonably have expected success in attaching the single-stranded oligonucleotide with the gaps in the biodetector of BERGGREN because both BERGGREN (1999) and (2001) teach attaching molecules using SAM, and FONACH teaches that DNA may be attached in

nanogaps on a similar device (para 57). It would further have been obvious to have fabricated the biodetector of BERGGREN (1999 and 2001) with the dimensions and properties taught by FONACH where the motivation would have been to fabricate nanoscale features without expensive lithography, as taught by FONACH (para 13).

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marjorie A. Moran whose telephone number is (571) 272-0720. The examiner can normally be reached on Monday-Friday; 6 am-2:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571)272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Marjorie A. Moran
Primary Examiner
Art Unit 1631

Marjorie A. Moran
2/4/07